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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/537,755	NISHIMURA ET AL.	
	Examiner	Art Unit	
	Seyed Azarian	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 17-31* is/are rejected.

7)☒ Claim(s) *12-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

RESPONSE TO AMENDMENT

1. Applicants' arguments filed, 9/23/2008, see page 10 through page 14, of remark, with respect to cancellation of claim 4, and amended claims 1, 3, 5, 7, 10, 12, 18, 20, and 30, have been fully considered but they are moot in view of the new ground (s) of rejection as necessitated by applicant's amendment is made in view of Kobayashi et al (2002/0118278 A1) and Haruhiro, "Magnification Endoscope in the Esophagus and Stomach".

The applicant is respectfully reminded that claims 4, 7, 8, and 12-16 in previous action were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However in brief telephone interview, examiner suggested ways to clarify the independent claim or amend the claim that may overcome the prior art of record, but agreement was not reached.

Applicant argues in essence that Kato does not disclose "extracting a target area based on evaluation of a result of matching using a plurality of templates".

Contrary to the applicant's assertion, limitations in the claim", the Examiner would like to point out that Kato clearly disclose (column 8, lines 14-22, the above-described processing realizes face-area recognition processing with a simple method, and as a result of face area recognition, central coordinates c(i,j) of the ellipse are obtained. Note that more precise face area recognition can be performed by repeating the above processing (refer to second extraction) while changing the radius of the ellipse. In this case, templates having plural radii are prepared in advance, and the above-described processing at steps S609 to S613 is repeated using the "various templates" (plurality of templates)), but does not explicitly state its corresponding "evaluation

result of matching".

However, for this feature "limitations in the amended claim", Examiner using this reference supplied with this action Kobayashi (2002/0118278 A1), page 6, paragraph (0077), in the digital processing circuit 62, image data is successively read from the bronchus-region-image data base, and the read image data is "compared" with the referential image data, using, for example, a well-known "pattern matching" method, to numerically "evaluate a degree" of coincidence between the read image data and the referential image data. In this embodiment, the degree of coincidence between the read image data and the referential image data is represented by a percentage.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kato invention according to the teaching of Kobayashi because combination of Kato face-area recognition processing using different templates and Kobayashi evaluation process provides a improve image quality during a medical examination, which can easily be implemented in an imaging device.

Applicant argues in essence regarding claim 10 that Kato does not disclose "the second extraction step of the method and system recited in the claim of the present invention "can surely remove noise, etc., not completely removable by the first extraction step".

The applicant is respectfully reminded that, it is noted that the features upon which applicant relies, "remove noise, etc., not completely removable by the first extraction step" are not recited in the rejected claim 10.

Applicant argues in essence regarding claim 18 that Kato does not teach or suggest "specifying the parameters, that is, the major axis, the minor axis and the center position".

The applicant is respectfully reminded that, it is noted that the features upon which applicant relies, "specifying the parameters, that is, the major axis, the minor axis and the center position" are not recited in the rejected claim (s).

Furthermore in response to applicant's argument, limitations in the claim 20, that Kato does not disclose "feature amount is calculated based on the "width" of a structural component extracted in the extraction step".

Contrary to the applicant's assertion Kato disclose (column 9, lines 12-19, FIG. 13, for the face area with the component LH2, the uantization "width" is set as Q.times.2; for the other areas than the LH2 face area, the quantization width is set as Q.times.8. In this arrangement, many of the conversion coefficients for the high frequency components out of the face area are quantized to 0. Accordingly, the coding amount can be greatly reduced without causing serious degradation of subjective image quality).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 6, 9-11, 17-27 and 30-31, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato (U.S. patent 6,665,446) in view of in view of Kobayashi et al (2002/0118278 A1).

Regarding claim 1, Kato discloses an image processing method comprising: an input step of inputting an image (see abstract, color-space conversion processor converts input digital image data into YUV color space, and a wavelet conversion processor performs wavelet conversion processing on the data);

and an extraction step of performing matching between a template, obtained by modeling a predetermined structural component in the image, and the image input in the input step to extract a structural component as an extraction target in the image (column 2, lines 14-24, the foregoing objects are attained by providing an image processing apparatus comprising: conversion means for converting input digital image data into coefficients based on spatial frequencies to obtain conversion coefficients; extraction means for extracting a specific area in an image represented by the digital image data based on the conversion coefficients; and quantization means for performing quantization processing on the conversion coefficients while changing a quantization characteristic in accordance with the specific area extracted by the extraction means, also column 6, lines 60-67, at step S609, pattern matching between a template for determination and the above-described image bitmap obtained by the flesh-color area detection processor. More specifically, the template is overlaid on the binary image bitmap generated at steps S602 to S608, and in an overlap portion between the template and the bitmap, the number Pi , j of pixels having pixel values corresponding there between is calculated);

an evaluation step o f setting a plurality of different templates to evaluate a result of matching using the different templates, wherein the structural component is extracted on the basis of the evaluation result in the evaluation step (column 8, lines 14-22, the above-described processing realizes face-area recognition processing with a simple method, and as a result of face

area recognition, central coordinates c (i, j) of the ellipse are obtained. Note that more precise face area recognition can be performed by repeating (second extraction) the above processing while changing the radius of the ellipse. In this case, templates having plural radii are prepared in advance, and the above-described processing at steps S609 to S613 is repeated using the "various templates" (plurality of templates)), but does not explicitly state its corresponding "evaluation result of matching". However, for this feature "limitations in the amended claim", Examiner using this reference supplied with this action Kobayashi (2002/0118278 A1), page 6, paragraph (0077), in the digital processing circuit 62, image data is successively read from the bronchus-region-image data base, and the read image data is "compared" with the referential image data, using, for example, a well-known "pattern matching" method, to numerically "evaluate a degree" of coincidence between the read image data and the referential image data. In this embodiment, the degree of coincidence between the read image data and the referential image data is represented by a percentage.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kato invention according to the teaching of Kobayashi because combination of Kato face-area recognition processing using different templates and Kobayashi evaluation process provides a improve image quality during a medical examination, which can easily be implemented in an imaging device.

Regarding claim 2, Kato discloses the image processing method according to claim 1, further comprising: a position specification step of specifying a position of the extraction target structural component in the input image by matching using the template, wherein in the extraction step, the extraction target structural component is extracted on the basis of the

matching result in the position specification step (see claim 1, also column 11, line 54 through column 12, line 2, extraction means for extracting a specific area in an image represented by lowest frequency components for a converted image obtained by said conversion means, said specific area being extracted from the converted image by pattern matching between an area having a predetermined color component value range and a predetermined shape; and quantization means for performing quantization processing on said conversion coefficients of said converted image while changing a quantization characteristic in accordance with the specific area extracted).

Regarding claim 6, Kato discloses the image processing method according to claim 2, further comprising: an extraction image formation step of forming a structural component extraction image on the basis of the position of the structural component and the template (column 7, lines 1-13, FIG. 9 is an explanatory view of pattern matching for face area detection according to the embodiment. In FIG. 9, numeral 71 denotes the binary image bitmap obtained by the flesh-color area detection processor 51; and 72, a determination template for determination in pattern matching. At step S609, the determination template is placed on the binary image bitmap, and in an area where the determination template overlaps with the binary image bitmap, the number Pi, j of pixels with pixel values corresponding between the template and the bitmap is counted. Note that alphabets i and j are coordinate values representing the central position of the template on the binary image bitmap).

Regarding claim 9, Kato discloses the image processing method according to claim 1, wherein the template has a one-dimensional shape of N.times.1 (N.gtoreq.3) and the matching is performed to the image in a plurality of directions (column 3, lines 54-60, FIG. 3 is an

explanatory view of the subsampling processing. In the subsampling processor 114a and 114b of the present embodiment, the U and V signals as color difference components are subsampled to 1/2 in both main-scanning direction and subscanning direction. More specifically, subsampling data U' and V' of the U and V components are obtained by, e.g., the following equation (2)).

Regarding claim 10, Kato discloses an image processing method comprising: an input step of inputting an image; a first extraction step of performing a first region extraction process to the image input in the input step to extract a first region group including one or more regions; and a second extraction step of performing a second region extraction process for every region included in the first region group (see claim 1, also column 2, lines 14-36, extracting a specific area in an image represented by the digital image data based on the conversion coefficients (first extraction) and quantization means for performing quantization processing on the conversion coefficients while changing a quantization characteristic in accordance with the specific area extraction by the extraction means. Further, another object of the present invention is to attain high-speed specific-are extraction processing by extracting the specific area using a low-frequency component image data resulted from wavelet conversion processing. Further, another object of the present invention is to attain high-speed specific-area extraction processing by using image data thinned in accordance with a predetermined reduction rate to extract the specific area having a predetermined size and a predetermined shape, as the specific area).

Regarding claim 11, Kato discloses the image processing method according to claim 10, wherein in the first extraction step, the region group is extracted such that the region group redundantly includes a structural component to be extracted in the image, and in the second extraction step, the region group is extracted such that an unnecessary structural component is

eliminated from the first region group (Fig. 7, column 5, line 65 through column 6, line 9, search processing necessary for recognition can be greatly reduced by utilizing the wavelet conversion coefficients of a lowest frequency component regarding subsampled UV components. Further, additional preprocessing such as noise removal is unnecessary by utilizing the low-frequency component data; high-frequency components are removed).

Regarding claim 17, Kato discloses an image processing method comprising: a filtering step of performing first and second band pass filtering to an image; a first binary image formation step of forming first and second binary images from the first and second band pass filtering results; a region group specification step of specifying a first region group including a structural component to be extracted in the image and a second region group including no structural component on the basis of logical operation for the first and second binary images; a re-extraction step of again extracting a desired structural component from the first region group on the basis of the second region group specified in the region group specification step; and a second binary image formation step of forming a binary image every region included in the first region group (see claim 1, also column 13, lines 36-42, extraction step, the matching is performed between a binary pattern representing positions of pixels having the color component values within the predetermined rate in said input digital image data, and a binary pattern representing the predetermined shape, and said specific area is extracted based on the result of said matching).

Regarding claim 18, Kato discloses an image processing method comprising: an input step of inputting an image; a reference image input step of inputting a reference image including information to specify a structural component to be extracted in the image input in the input step;

a parameter generation step of generating a plurality of parameters for a process of extracting the structural component; an extraction image formation step of performing the process of extracting the structural component to the input image using the parameters generated in the parameter generation step to form a plurality of extraction images; a comparison step of comparing the degrees of matching between the extraction results of the extraction images formed in the extraction image formation step and the structural component in the reference image; and a parameter specification step of specifying parameters with high degree of matching on the basis of the comparison result in the comparison step (see claim 1, also column 6, lines 29-42, first, at step, initialization is performed on various parameters. Next, at step, among the wavelet conversion coefficients for the color difference components U and V stored in the RAM used as a buffer memory, data of the lowest frequency component is obtained. At step S603, it is determined whether or not the obtained conversion coefficient value Ui, j (I j : pixel position) resides between a predetermined threshold values T.sub.UL and T.sub.UH. If the U component value resides between these two threshold values, further, it is determined at step S604 whether or not the conversion coefficient value Vi,j of the V component is between predetermined threshold values T.sub.VL and T.sub.VH. If the V component resides within these two threshold values, the pixel value Ii,j of the binary image bitmap is set to 1 at step S605).

Regarding claim 20, Kato discloses an image processing method comprising: an input step of inputting an image; an extraction step of extracting a predetermined structural component from the image input in the input step; and a feature-amount calculation step of calculating the amount of feature based on the width of the structural component extracted in the extraction step (column 4, lines 14-21, using a plurality of quantization tables based on the result of recognition

by the face-area recognition processor 116. More specifically, in an area determined as a face area, small quantization coefficients (quantization coefficients with narrow quantization step widths) are used, and in other areas, large quantization coefficients (quantization coefficients with wide quantization step widths) are used, also column 6, line 60 through column 7, line 12, first, at step S609, pattern matching between a template for determination and the above-described image bitmap obtained by the flesh-color area detection processor 51. More specifically, the template is overlaid on the binary image bitmap generated at steps S602 to S608, and in an overlap portion between the template and the bitmap, the number Pi, j of pixels having pixel values corresponding there between is calculated).

With regard to claims 19, 21-27 and 30-31 the arguments analogous to those presented above for claims 1, 2, 6, 9, 17, 18 and 20 are respectively applicable to claims 19, 21-27 and 30-31.

4. Claims 3, 5, 7-8 and 28-29, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato (U.S. patent 6,665,446) in view of in view of Kobayashi et al (2002/0118278 A1) as applied to claims above and further in view of Haruhiro, "Magnification Endoscope in the Esophagus and Stomach".

However regarding claim 3, Kato discloses (column 6, lines 60-67, at step S609, pattern matching between a template for determination and the above-described image bitmap obtained by the flesh-color area detection processor. More specifically, the template is overlaid on the binary image bitmap generated at steps S602 to S608, and in an overlap portion between the template and the bitmap, the number Pi, j of pixels having pixel values corresponding there between is calculated, but neither Kato nor Kobayashi explicitly state its corresponding

"magnitude (sizes and depths) of variation in the width". On the other hand Haruhiro teaches (page 40, second paragraph in the esophagus, magnification endoscopy facilitates well, both to the diagnosis of the negatively stained lesion with iodine and to the evaluation of infiltration depth of squamous cell carcinoma. In squamous epithelium magnification, endoscopy reveals changes of fine vascular network pattern on the mucosa and submucosa. Regularly arranged intrapapillary capillary loops (IPCL) are normally observed by utilizing magnification endoscopy (Fig. 1). IPCL shows characteristic changes in carcinoma h7 situ. Those include weaving, dilatation, irregular caliber and a different shape in each IPCL. According to the grade of IPCL changes, target epithelium can be diagnosed from normal mucosa (Type I) to carcinoma (Type V) (Fig.2). By the evaluation of IPCL changes, infiltration depth of the cancerous lesion can also be assessed. In the m_1 lesion, characteristic changes in are observed (Fig. 2). In the rrL, lesion the elongation of affected IPCL is observed, and in the m_3 lesion destruction of IPCL becomes much more obvious. In the sm cancer, almost total IPCL has been destructed and a novel tumor vessel often appears (Fig. 3). In the esophagus, the usefulness of magnifying endoscopy is gradually but steadily recognized).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kato and Kobayashi invention according to the teaching of Haruhiro because combination of Kato and Kaufman provides improved magnification endoscopy, and enhanced visualization and navigation properties, which can easily implemented in an imaging device.

With regard to claims 5, 7, 8, 28 and 29 the arguments analogous to those presented above for claims 1, 2, 6 and 10 are respectively applicable to claims 5, 7, 8, 28 and 29.

Allowable Subject Matter

5. Claims 12-16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehta Bhavesh, can be reached at (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.
Status information about the PAIR system, see http:// pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Seyed Azarian/
Primary Examiner, Art Unit 2624
Group Art Unit 2624
December 8, 2008